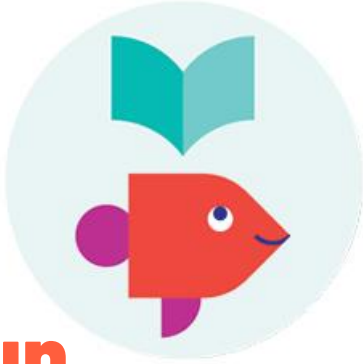
Summer at the Library 2022

MAKE WAVES



Grades 3-5

Ocean Zones: Layers of Fun

Did you know the ocean is made up of layers called zones? Let's simulate the various ocean zones using different types of liquids and explore the different types of ocean life that lives in each zone.

What will you learn?

- The ocean is made up of layers called zones
    - There are 3 major ocean zones
- Explore what animals live in the ocean in each zone
- The depth of each zone

Materials:

- A large glass style jar 30 oz or bigger (mason jars or large vases work well) Note: The glass should be tall NOT wide.
- Vegetable Oil
- Blue Dish soap (eg, DAWN brand)
- Water
- Food coloring
- 3 paper cups
- 3 plastic spoons
- Masking tape
- Paper and pencils

Instructions:

- Take your large jar or vase and using masking tape, divide your jar into 3 equal layers.
- Label each layer starting from the top Zones 1 through 3.
- On a sheet of paper label all three zones with their names.

- The ocean is generally divided into three zones which are named based on the amount of sunlight they receive: sunlight zone, twilight zone, or midnight zone.
    - **1st layer:**
        - In the cup, fill about 3/4 of your cup with dish soap.
        - Mix in some food coloring!
        - Then slowly pour the mixture very slowly into the bottom of your jar.
    - **2nd layer:**
        - In a separate cup, fill about 3/4 of your cup with water.
        - Mix with blue food coloring.
        - Then slowly and carefully pour the mixture into your jar. Our goal is to have this layer sit on top of the dish soap.
            - Hint: Don't pour too quickly!
    - **3rd layer:**
        - In a separate paper cup, fill about 3/4 of your cup with oil.
        - Pour very carefully into your jar, on top of the water.
            - It would be nice if this layer was also a fun color, but you cannot mix the oil with food coloring because food coloring is water based.
            - Remember oil and water do not mix and oil floats on water because it is light and less dense than water!
- Write what marine life you think lives in each layer. Why do you think they live there?

Reflection Questions:

- What are the layers of the ocean? How many are there?
- What are the names of the layers of the ocean?
- Do the layers mix? Do you think the layers in the ocean mix? Why or why not?
- What kind of life lives in each layer? Why?
- What is the depth of each layer?

Explanation:

The ocean is generally divided into three major zones which are named based on the amount of sunlight they receive: the euphotic, dysphotic, and aphotic zones. These zones can be further divided into more layers, but in this experiment we will learn about the three major zones:

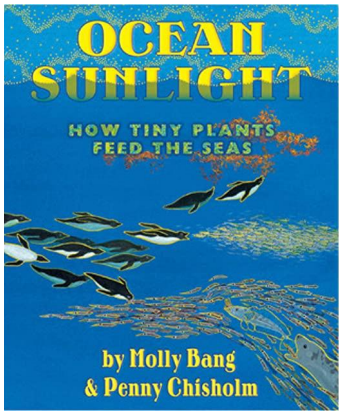
- The clear oil represents the sunlight zone or epipelagic zone. In the sunlight zone, you'll find ocean animals such as tiger sharks, jellyfish, sea turtles, blue whales, dolphins and plants. This is the ocean zone that sunlight penetrates. Because this zone gets sunlight, photosynthesis can occur and plants can grow here. The sunlit zone goes down to about 660 feet.

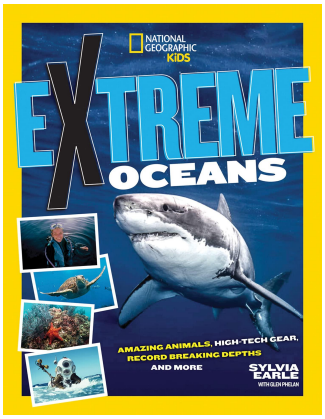
- The blue water represents the twilight, dysphotic, or mesopelagic zone. In this zone you'll find ocean animals such as crabs, octopi, sea stars and sperm whales. The next zone is the dysphotic or twilight zone. Some sunlight reaches this zone, but not enough for photosynthesis to occur. You won't find plant life in this zone. The dysphotic zone goes down to about 3,300 feet.
- The darkest blue detergent represents the midnight zone, also known as the bathypelagic, abyssopelagic, or hadopelagic zone. In the midnight zone, you'll discover ocean animals such as the sea cucumber, the anglerfish, and the vampire squid. No sunlight reaches this zone and it can reach depths of close to 20,000 feet. Sometimes people divide the midnight zone into two zones: the aphotic zone and the abyss. Some microscopic life has been found in the abyss.

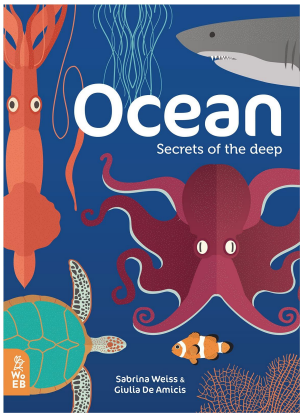
The surface layers and deep ocean layers are of very different densities (due to salt content and temperature), these layers of the ocean do not mix easily. The ocean gets more dense and you get deep and the temperature drops as well.

More to Explore at the Library:

Dive deep, deep, deep into some great books!







Guide created by Sharon Rickson.